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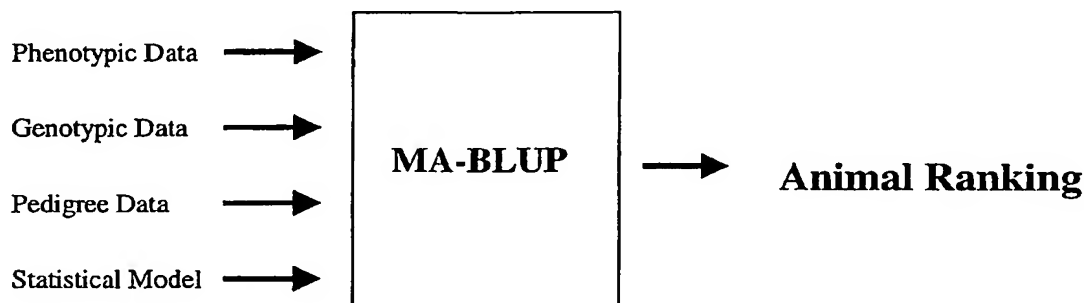
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(54) Title: **MARKER ASSISTED BEST LINEAR UNBIASED PREDICTED (MA-BLUP): SOFTWARE ADAPTIONS FOR PRACTICAL APPLICATIONS FOR LARGE BREEDING POPULATIONS IN FARM ANIMAL SPECIES**



(57) Abstract: The invention provides methodologies for improved molecular genetic analysis of individual animals and animal populations. The invention includes methods and systems for identifying those animals in a population that are most likely to heritably pass on desirable traits. Provided are means for evaluating the estimated breeding values and increasing the average genetic merit for animals in a population. For each trait, the instant invention provides methods for evaluating the relative effect of one or more quantitative trait loci (QTL) and three or more molecular genetic markers for each QTL. The relationship between these various markers and the pre-selected trait and QTL is calculated, along with the contribution of other factors such as pedigree and known measures with respect to quantitative trait, and these data are used to calculate estimated breeding values for the animals in the herd and to rank the animals according to these estimated breeding values.

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